

## **REMARKS/ARGUMENTS**

### **1.) Claim Amendments**

Claims 19-20, 23, 27, 29-30, 32 and 35-44 are pending in the application. Claims 19 and 27 have been amended to correct a typographical error. Claims 19, 23, 27, 29-30, 32 and 35 have been amended to more fully distinguish the claims from the cited reference. Favorable reconsideration of the application is respectfully requested in view of the foregoing amendments and the following remarks.

### **2.) Claim Rejections – 35 U.S.C. § 102(a)**

The Examiner rejected claims 19-21, 24, 25 and 35-38 under 35 U.S.C. § 102(a) as being anticipated by Midtgaard (US 2002/093389). The Examiner's consideration of the amended claims is respectfully requested.

Amended claim 19 provides, in pertinent part:

A balanced crystal oscillator circuit...having...a first oscillator sub-circuit incorporating a first transistor and a second oscillator sub-circuit incorporating a second transistor...wherein the oscillator sub-circuits are configured with a first, second and third interconnection....comprising:

*...wherein at least one of the transistors is provided with bias current* and said first and second oscillator circuits being arranged to interact by means of said first and second resonator elements to form a balanced oscillator signal.

With respect to the biasing, ("...wherein at least one of the transistors is provided with bias current..."), it is noted, in discussing the Vittoz reference in the prior art section of the present application, that a common base (CB) circuit is more difficult to bias than the common collector (CC) circuit. This is recognized by Vittoz as his configuration favors the single-ended CE circuit (i.e. the Pierce oscillator) over the single-ended CB circuit. Hence, an objective of the present invention was to obtain the benefits cited by

Vittoz in a *balanced crystal oscillator circuit*. Hence, in the present invention, a CC circuit is implemented in an embodiment of the balanced crystal oscillator circuit. In this configuration, any substrate coupled noise will be diverted to the ground potential and will not enter the oscillator (as seen in Figures 2a and 2c). Hence, in operation, the same biasing current is achieved through the different capacitors (e.g., 205, 206) of the CC embodiment of present invention. This is an important distinction over Midtgaard which uses a CB circuit (see Figure 1 of Midtgaard).

In order for the configuration disclosed in Midtgaard to achieve the same current through the two different capacitors (i.e., capacitors 16 and 17 of Figure 1), complex current generators are required (see current generator means 21 and 22 of Midtgaard). The current generator means is not needed in the CC circuit of the present invention and hence is an advantage of the present invention over Midtgaard. In other words, the present invention is adapted to achieve the same currents through the two different capacitors 205, 206 respectively. This is related to the fact that the different potentials below the different capacitors 205, 206 (i.e., on the collector side of the transistors) is the same in the CC circuit. Notably, the different potentials below the different capacitors is not the same in the CB circuit. Claims 20, 23, 27, 29, and 35-38 depend from amended claim 19 and recite further limitations in combination with the novel elements of claim 19. Therefore, the allowance of claims 19, 20 and 35-38 is respectfully requested.

### 3.) Claim Rejections – 35 U.S.C. § 103(a)

The Examiner rejected claims 22, 23 and 26-34 under 35 U.S.C. § 103(a) as being unpatentable over Midtgaard. Claims 22, 26, 28, 31 and 33-34 have been canceled. Claims 23, 27, and 29 are now dependent on amended claim 19. With regard to claims 30 and 32, these claims are directed to transistors of the Metal Oxide Semiconductor (MOS) type used in a dual common-drain transistor coupling configuration and hence are analogous to the CC configuration used in a BJT transistor. In the Office Action, the Examiner notes that Midtgaard fails to disclose a balanced crystal oscillator circuit having a CC configuration. While the CC configuration may be known in the art for single transistor amplifier configurations based on desired input and

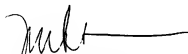
output impedance considerations, their use in a balanced crystal oscillator circuit of the present invention obtains previously undiscovered benefits in reducing noise to the oscillator, which is an advantage well beyond a particular coupling characteristic. Claims 23, 27, and 29 depend from amended claim 19 and recite further limitations in combination with the novel elements of claim 19. Claim 32 depends from amended claim 30 and recites further limitations in combination with the novel elements of claim 30. Therefore, the allowance of claims 23, 27, 29-30 and 32 is respectfully requested.

**CONCLUSION**

In view of the foregoing remarks, the Applicant believes all of the claims currently pending in the Application to be in a condition for allowance. The Applicant, therefore, respectfully requests that the Examiner withdraw all rejections and issue a Notice of Allowance for all pending claims.

The Applicant requests a telephonic interview if the Examiner has any questions or requires any additional information that would further or expedite the prosecution of the Application.

Respectfully submitted,



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